

REMARKS

Claims 1 - 2, 4 - 18, and 20 - 47 are pending. Claims 3, 19, 48, and 49 have been cancelled. Claims 1, 5, 9, 11, 13, 17, 18, 20, and 25 - 27 have been amended. No new matter has been introduced. Reexamination and reconsideration of this application are respectfully requested.

In the December 18, 2003 Office Action, the Examiner rejected claims 1-49. The Examiner rejected claims 1-3, 5-13, 15-21, and 23-49 under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,504,270 to Sethares ("the Sethares reference"), in view of U.S. Patent No. 5,536,902 to Serra ("the Serra reference"). The Examiner rejected claims 4, 14, and 22 were rejected under 35 U.S.C. §103(a) as being obvious over the Sethares reference, in view of a combination of the Serra reference, and further in view of well known prior art.

Representative independent claim 1 recites (with emphasis added):

"An apparatus for converting an input voice signal into an output voice signal according to a reference voice signal, the apparatus comprising:
extracting means ...;
separating means ...;
memory means ...;
first modulating means for modulating the frequency value coordinates of the sinusoidal wave components of the input voice signal according to the reference pitch information retrieved from the memory means, to generate modulated frequency value coordinates;
second modulating means for modulating the amplitude value coordinates of the sinusoidal wave components of the input voice signal according to the reference amplitude information representative of the reference amplitude value coordinates which are numbered correspondingly to the amplitude value coordinates of the input voice signal, retrieved from the memory means;
combining means for combining the modulated frequency value coordinates and the modulated amplitude value coordinates to synthesize sinusoidal wave components of the output voice signal having an output pitch and an output timbre different from an input pitch and an input timbre, of the input voice signal, and influenced by a reference pitch and a reference timbre, of the reference voice signal; and
mixing means ..."

The limitations of claim 1, emphasized above, may be referred to as the first and second modulating means limitations. The Examiner states that the Sethares reference teaches the modification of the frequencies of the partials based on a desired pitch or timbre, and that this reads on modulating means for modulating the frequency value coordinates of the sinusoidal wave components. (*December 18 Office Action, page 3*).

The Sethares reference is directed to a method and apparatus for receiving an audio input signal including an input partial and evaluating the dissonance of the input signal relative to a set of reference partials, and for producing an output signal having greater or smaller dissonance. Dissonance is the degree to which an interval sounds unpleasant or rough. (*Sethares, col. 2, lines 12 - 17*). In an embodiment of the Sethares invention, an analog input signal may be passed through a series of bandpass filters having differing pass-through frequencies. The amplitude of the signal derived from each bandpass filter is associated with a pass-through frequency of the filter, to produce the frequency amplitude information required to determine dissonance. The frequency and amplitude information is fed to a computer programmed to carry out a dissonance reduction calculation. (*Sethares, col. 9, line 57 - col. 10, line 5*). In a MIDI embodiment of the Sethares invention, an input signal timbre including a characteristic profile of partials is assigned to a note indicated by the MIDI controller. The computer assigns a previously chosen timbre location to the pitch designated by the MIDI control command, to define a series of input partials. A choice of reference partials is provided to the computer and the computer has a program to modify the dissonance of the input partials according to a dissonance equation. The output signal is more or less dissonant than the input signal with respect to the source of reference partials.

(Sethares, col. 10, lines 6 - 28.)

This is not the same as an apparatus for converting an input voice signal including a first modulating means for modulating the frequency value coordinates of the sinusoidal wave components of the input voice signal according to the reference pitch information retrieved from the memory means, to generate modulated frequency value coordinates. Instead, the Sethares reference discloses calculating the dissonance between frequency and amplitude information of an input signal and this information in a reference signal and for producing an output signal having greater or typical smaller dissonance than the input signal. Calculating dissonance is not the same as modulating frequency value components by reference frequency components. Accordingly, applicants respectfully submit that claim 1, as amended, distinguishes over the Sethares reference.

The Examiner states that the Sethares reference does not specifically teach modulating amplitude value coordinates for combining the modulated amplitude value coordinates to synthesize sinusoidal wave components of the output voice signal. (*December 18 Office Action, page 4*). Applicants agree with the Examiner and claim 1, as amended, further distinguishes over the Sethares reference because the Sethares reference does not disclose second modulating means for modulating the amplitude value coordinates of the sinusoidal wave components of the input voice signal according to the reference amplitude information representative of the reference amplitude value coordinates which are numbered correspondingly to the amplitude value coordinates of the input voice signal.

The Serra reference does not make up for the deficiencies of the Sethares

reference. The Examiner states that the Serra reference teaches a method and apparatus for extracting and controlling a sound parameter and implementing extraction of deterministic components such as frequency and amplitude which are used to produce a synthesized output from mixing or combining the modulated frequency and amplitude components. (*December 18 Office Action, page 4*). However, the Serra reference does not disclose, teach, or suggest either of the first or second modulating means limitations of claim 1, as amended.

Specifically, the Serra reference is directed to a music synthesizer that includes an analysis section for analyzing an original sound, and a synthesis section for synthesizing a sound based on the analyzed representation. (*Serra, col. 8, lines 39 - 44*). A SMS (spectral modeling synthesis) analyzer obtains SMS data including frequency and magnitude trajectories from the input sound signal. Columns 10 - 14 of the Serra reference, (pointed to by the Examiner as disclosing analyzing and synthesizing a sound to produce a synthesized output signal from mixing or combining the modulated frequency and amplitude components) mainly disclose extracting frequency and amplitude components and normalizing the frequency and amplitude components, along with extracting other characteristics of the signal. The extracted and normalized information is referred to as SMS data. In the Serra reference, this SMS data is stored in a data memory and read out from the data memory by the reproduction processor. The reproduction processor reproduces a desired sound by reading out the stored data and performing various data manipulation processes based on the readout SMS data and musical parameters. (*Serra, col. 10, line 45 - col. 14, line 25*). There is no discussion in the Serra reference of the SMS data ever being

modulated, either by reference pitch information or by reference amplitude information.

Thus, the Serra reference does not disclose either of the first or second modulating means limitations of claim 1, as amended. Accordingly, applicants respectfully submit that claim 1, as amended, distinguishes over the Serra reference, alone or in combination with the Sethares reference.

Independent claims 9, 13, 17, and 25 - 27 recite similar limitations to one or both of the modulating means limitations of independent claim 1, as amended. Accordingly, applicants respectfully submit that independent claims 9, 13, 17, and 25 - 27 distinguish over the Sethares and Serra references, alone or in combination, for similar reasons as discussed above in regard to independent claim 1, as amended.

Dependent claims 2, 4 - 8, 10 - 11, 14 - 16, 18, 20 - 24, and 28 - 47 depend, directly or indirectly from independent claims 1, 9, 13, 17, and 25 - 27. Accordingly, applicants respectfully submit that dependent claims 2, 4 - 8, 10 - 11, 14 - 16, 18, 20 - 24, and 28 - 47 all distinguish over the Sethares and Serra references, alone or in combination, for the same reasons as discussed above in regard to independent claims 1, 9, 13, 17, and 25 - 27.

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Applicants believe that the foregoing amendments place the application in condition for allowance, and a favorable action is respectfully requested. If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call either of the undersigned attorneys at the Los Angeles telephone number (213) 488-7100 to discuss the steps necessary for placing the application in condition for allowance should the Examiner believe that such a telephone conference would advance prosecution of the application.

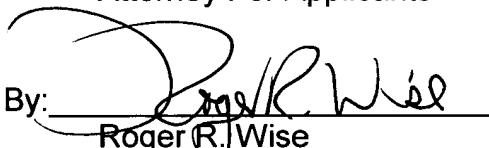
Respectfully submitted,

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